

SWAN LAKE QUARTERLY NARRATIVE REPORTS

FEBRUARY 1940 - JANUARY 1941

ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

DATE: 2-18 1941

✓ MR. SALYER
 ① ✓ ~~MRS. WOODEN~~
 ✓ ~~MR. ELMER~~
 MRS. GARVIN
 ✓ MR. DUMONT

JS
Whw
acc
PAD

SECTION OF HABITAT IMPROVEMENT:

~~Mr. Kibicki~~
~~Mr. Smith~~ PAD
~~Mr. Griffith~~ REG
 Miss Cook dwc

SECTION OF OPERATIONS:

Mr. Ball
 ✓ ~~Mr. Krammes~~ WT
 Mrs. Watkins
 Mrs. Kricun

SECTION OF ERA:

Mr. Regan ZJR
 ✓ ~~Dr. Bourne~~ WSB
 Mrs. Fishman

SECTION OF LAND MANAGEMENT:

~~Mr. Pashaw~~
~~Mr. Kerkmeier~~ COA

STENOGRAPHERS:

Miss Price
 ✓ ~~Miss Wherley~~ UW

SECTION OF STRUCTURES:

~~Mr. Taylor~~ WV7
~~Mr. Gustafson~~ 100

REMARKS:

Swan Lake Quarterly
November '40 - January '41

Return to:

Cook

TRANSMITTED BY REGIONAL OFFICE

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SWAN LAKE NATIONAL WILDLIFE REFUGE
QUARTERLY NARRATIVE REPORT
NOVEMBER, DECEMBER, 1940 & JANUARY, 1941

I GENERAL

Principal field activities at this station during the quarter included grain collection, maintenance and repair of equipment, fencing and buildings, predator control, disposal of surplus firewood through special use permit, patrol of the refuge and levees and operation of the first control gate to maintain a 662 level in the recently completed upper pool.

First water impounded. A series of levees and control structures are under construction at this refuge which will impound water in three large lakes. The water retaining structures for the first of these pools were completed last fall and sufficient runoff occurred during December and January to fill this unit to the desired level--662. This was the first water impoundment attempted at the refuge and has converted an area of dry, prairie bottomland into a lake and marsh of approximately 2000 acres. Waterfowl feeding in the Swan Lake area immediately began flocking to the newly formed lake and concentration of 5-10,000 birds were observed there daily during the first half of January. Weather conditions and lack of water area usually force the birds to migrate at this season but this year a considerable number of mallards and pintails remained through January and it is believed this will be the first season the birds have wintered here since the project was established.

A. Weather Conditions;

Weather conditions during November and December were about average

Survey
note
new

Jan 5-10
1941

for this season but precipitation was unusually heavy during January. The winter months in this area are usually characterized by moderate rains and light snow, which usually melt in 2-5 days. There is seldom any prolonged covering of deep snow. During the storm of November 11 only snow flurries and a high wind occurred here while a severe blizzard and cold wave were experienced less than 200 miles to the north.

Summary of Weather Conditions

	<u>Precipitation</u>		<u>Max. Temp.</u>	<u>Min. Temp.</u>
November	3.14"		73	5
December	1.72"		62	8
January	<u>4.01"</u>		<u>50</u>	<u>4</u>
Total	8.87"	Extremes	73	4

Precipitation during January in this area was the second heaviest on record, according to the U. S. Weather Bureau.

B. Water Conditions.

The heavy precipitation during January caused a heavy runoff in the two creeks which feed the refuge lakes and approximately 4000 acre feet of water were impounded in the upper pool by January 17, requiring opening of the control gate to release flood water. A level of 662 is to be maintained until June 1. The water level in this pool rose to a peak of 63.4 on January 24 and 4880 acre feet were released during that month. The control gate has proved adequate for handling surplus water to date but it is believed the pool will raise sufficiently to cause some runoff through the spillway this spring. The water is now standing 4 feet below the spillway.

II WILDLIFE

A. Waterfowl.

The fall flight was the heaviest since the refuge was established.

Date?

The number of birds concentrated on this area at the height of the migration was estimated at 25,000 as compared to 6,000 during the previous fall. This was not an exceptionally large concentration but does represent an encouraging increase, in view of the fact that water area was limited to a few acres in the borrow pits and small potholes until mid December, when the upper pool began to fill.

The main wave of the fall migration began on November 10-11th when a severe blizzard and cold wave in the north drove the birds southward. Many flocks were noted passing over at that time travelling with the strong northwest wind and a considerable number of the migrants stopped to rest and feed at the refuge. Food was plentiful on the refuge area but water was confined to the borrow pits and small ponds until the latter part of December. There was apparently much daily migration between the Missouri River bottoms and the refuge during November and early December, until the upper pool was flooded, when the birds began flocking to the new lake after feeding in the cornfields. About 1700 birds were present on the area during the annual census on January 26-27-28, a snowstorm driving most of them southward that week.

1. Populations.

a. Species (*Including data from previous quarter)

✓ *Canada Goose (*Branta canadensis canadensis*)

First observed--October 4, 1940

Last observed --October 25, 1940

Remarks-- Small flocks 5-25 birds moved over during October. No large concentration.

*Lesser Snow Goose (*Chen hyperborea hyperborea*)

✓ *Blue Goose (*Chen caerulescens*)

Remarks--Several mixed flocks of 15-300 birds observed from October 15-18 in flight over refuge.

✓ Common Mallard (*Anas platyrhynchos*)

First observed -- August 23, 1940 ✓
 Period maximum abundance and number--Nov. 10-Dec. 15, 15,000
 Last noted as migrants -- January 15, 1941
 Remarks - - Several hundred birds remained in January
 resting in small open areas on the upper pool.

✓ Black Duck (*Anas rubripes*)
 Scattered birds observed among flocks of the common mallard
 from November 10, January 15th.

✓ *Baldpate (*Mareca americana*)
 First migration--October 10, 1940 ✓
 Last noted as migrant--November 11, 1940
 Remarks--Small flocks observed with other migrants.

✓ American Pintail (*Dafila acuta tzitzihoa*)
 First migration--August 23, 1940
 Period maximum abundance and number--Nov. 10-Dec. 15, 5000
 Last noted as migrant--December 25, 1940
 Remarks--Ranked next to mallard in numbers.

✓ Green-winged teal (*Nettion carolinense*)
 First migration noted--October 21, 1940 ✓
 Last noted--November 11, 1940
 Remarks--Small flocks noted occasionally during flight.

✓ Blue-winged teal (*Querquedula discors*)
 First migration--August 23, 1940 ✓
 Last noted as migrant--October 24, 1940
 Remarks--Only small flocks noted during fall flight-no
 large concentration.

✓ Shoveller (*Spatula clypeata*)
 First observed--September 15, 1940 ✓
 Remarks--Few scattered birds noted among other migrants
 during migration.

✓ Wood duck (*Aix sponsa*)
 Remarks--This bird is a summer resident and nests in some
 numbers. Observed in small flocks of 10-20
 to October 31, 1940.

✓ Redhead (*Nyroca americana*)
 Only record--November 13, 1940, 5 birds.

✓ Ring-necked duck (*Nyroca collaris*)
 First observed--October 11, 1940 ✓
 Period maximum abundance and number--Nov. 9-15, 1500
 Last observed--November 20, 1940

✓ Lesser Scaup (*Nyroca affinis*)
 A few small flocks noted from Nov. 9-20, 1940.

- ✓ American goldeneye (*Galucionetta clangula americana*)
Single record--single female, November 23, 1940.

B. Upland Game Birds. ✓

About 250 prairie chickens are wintering on the refuge and feeding in corn and cane field raised under cooperative agreements. The largest flock noted contained 100 birds and was observed about $\frac{1}{2}$ mile southeast of the headquarters buildings. The birds are beginning to congregate on the No. 3 levee during the early morning hours and the booming season will begin shortly.

✓
The bob-white population is estimated at 500 birds. Corn and cornfields are providing an abundant source of feed and no artificial feeding has been necessary to date.

A few pheasants are present on the refuge. These birds have not been successfully propagated in this section of the state.

C. Fur Bearers, Predators, and Others.

✓
Fur bearing species present on the refuge include opossum (est. 50), Muskrat (est. 25) very scarce, Mink (est 30), Skunk (est 100), Civet cat (est. 100), raccoon (est.25), red fox (est.2), coyote (est.4-5).

Permission was obtained to control coyotes on the area and trapping operations were started in December. Heavy rains have made trapping difficult as alternate freezing and thawing in the small depressions damages the sets.

✓
Cottontail rabbits and mice are very abundant-probably due to the heavy cover present over much of the refuge. Remains of these animals are frequently noted in the field where they are captured by coyotes, hawks, owls, and other predators.

Many hawks and owls have been attracted to the area by the presence of the small rodents. Rough-legged hawks are more abundant

this year than any previous season and about 3 out of 5 hawks are of this species.

Upland game birds and waterfowl have not been molested to any extent by predators as our observations indicate that rabbits and mice are their principal source of food.

III REFUGE DEVELOPMENT AND MAINTAINENCE

The CCC draglines have been moved to the site of the No. 4 levee on the west boundary of the Swan Lake Tract, directly north of headquarters and are now working on this project. This levee, which will probably be completed by July 1, will impound water in the partially dry lake bed from which the refuge derives its name. A gravelled road will be constructed on the levee to provide access to headquarters from the Summer-Mendon highway and eliminate the trail and hazardous railroad crossing now in use. Flooding of this old lake bed will restore a valuable resting and feeding area as remnants of aquatic and marsh vegetation still persist in the ditches and low areas and residents of the community frequently mention the enormous concentrations of waterfowl which gathered in this lake as late as 1929.

Two concrete core walls were constructed in the bed of the lower spillway by CCC crews and riprapping for this structure will be laid during the spring.

The empty concrete silo standing near the observation tower at headquarters has been cut down to a height of 8 feet and roofed to provide storage quarters for paints, oils, and other inflammable material.

880 rods of fencing were completed during the quarter to close in unfenced gaps along the north boundary where the land acquisition had been delayed.

A water supply system has been constructed at Secondary Headquarters. This project included construction a 30 foot tower and insulation box for housing a 500 gallon supply tank, and laying of approximately 75 feet of pipe line.

A 5' x 8' cabinet was constructed in the office for storage purposes.

Approximately 40 acres of timber were cleared from the lower reservoir site on the Elk Creek bottoms. 50,000 feet of piling were sawed for use at Swan Lake and other refuges.

All of the above projects were completed by CCC labor.

B. Plantings.

Recent plantings of trees and shrubs (spring, 1940) were sprayed with a repellent to check rodent damage.

The new seeding and sod plantings on levees No. 1 & 3, completed last year, are apparently quite well established and should afford some protection to the pool slope this year. The levees will be mowed during the spring months to prevent the nurse crop and weed growth from becoming too rank.

IV PUBLIC RELATIONS

Roads and weather conditions at this season are more or less unfavorable for visitors but approximately 250 persons visited the refuge during the quarter. Small groups of visitors, appear from time to time, on weekends or holidays and occasionally during the week. Visitors are allowed to climb the towers and the work projects and purpose of the refuge are described by refuge personnel.

The writer and commanding officer of the refuge CCC company attended a meeting of the Chillicothe, Mo., Kiwanis Club on January 27

at the invitation of their program committee to describe the refuge and the part played by the enrollees in developing the area.

Official visitors at the refuge included (Regional Office) Mr. F. C. Gillett, W. E. Hall, C. W. Nelson, W. E. Vroman, (Washington Office) Mr. W. V. Taylor, (State Conservation) Messrs, R. L. McKinney, Fred Bickel, J. Frost, Berry, and Beach. Mr. P. C. Jeans, President of the Howard County Wildlife League visited the project on January 30.

B. Enforcement.

Hunting clubs on the south boundary of the refuge were checked for licenses of members and compliance with 1940 regulations and trappers operating along the boundary were checked for licenses and compliance with the new state trapping code.

V ECONOMIC USES OF REFUGE

A. Grazing.

<u>Acreage</u>	<u>No. animals</u>	<u>Period used</u>	<u>Revenue</u>
240	46	Oct 11 to Dec 10, 1940	\$23.00
(Permit expired and final collection made)			(final collection)

B. Timber Removal.

Approximately 40 acres of timber was cleared in the lower pool site above No. 2 spillway.

Approximately 50,000 feet of piling was sawed by the Camp during this period from material cut from the lower pool.

29 cords of firewood were sold to local residents during the quarter and revenue collected from this source amounted to \$21.75.

C. Cooperative Farming.

Tabulated on next sheet.

C. Cooperative Farming.

Permittee	Number	Crop	Acreage	App. Yield	Bu. Collected	Left in field
Barnett, J.C.	3103	Hegari	9 ✓	25		3 acres ✓
Bloss, Nyle	2493	Corn	40 ✓	40		
		Grohoma	20 ✓	20		20 acres ✓
Doss, A. R.	2498	Grohoma	80 ✓	33		26½ acres ✓
Downey & Thornsberry	2490	Corn	90 ✓	29	1032 ✓	
		Soy beans	10 ✓			4 acres ✓
Fox, J.R.	2494	Corn	40 ✓	35		
		Grohoma	20 ✓	30		20 acres ✓
Schafer, John	2484	Corn	80 ✓	30		27 acres ✓
Sharp, J.P.	2492	Corn	60 ✓	35		20 acres ✓
Smith, Richard	2491	Corn	40 ✓	40		
		Hegari	20 ✓	30		20 acres ✓
Williams, Bros	2482	Corn	40 ✓	25	330 ✓	
		Soy beans	20 ✓	20		6 2/3 acres ✓
Williams, Maurice	2483	Corn	40 ✓	25		13 1/3 acres ✓
" "	817	Wheat	35	18	196 ✓	

The above figures indicate collections made under share cropping permits from July 1, 1940 to December 31, 1940.


The crop yields, especially for corn, were light this season because of drouth and heat during the growing season. Most of these cooperators used the open pollinated variety of corn which was harmed considerably by drouth and heat during the tasseling stage and the yield was cut below average. The average yield for corn was about 30 -35 bushels and about 27 bushels for cane crops, which was about average over the entire county.

VI OTHER ITEMS

Work project contemplated during the next quarter included

(10)

landscaping at the two headquarters sites, cover mapping, planting of additional food and cover, construction of rail fencing and planting cover for quail demonstration area near the headquarters site, and maintenance of the levees.


Signature of Field Officer

Jr. Refuge Manager
Title



View of north end of upper pool
Summer, 1940, prior to flooding



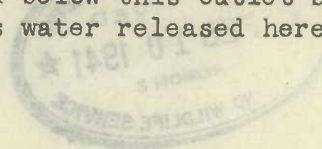
Same area, January, 1941
after flooding.



Control gate in No. 3 levee
operating at capacity (4 ft.)



Showing discharge from control
gate. A large marsh has been
created below this outlet by
surplus water released here.



GRESS STUDIO
Pamphlet
FEB 4 1941

GRESS STUDIO
Pamphlet
FEB 4 1941

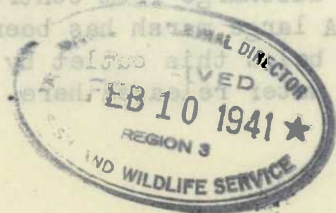
Same area, January, 1941
after flooding.

View of north end of upper pool
Summer, 1940, prior to flooding

GRESS STUDIO
Pamphlet



Showing discharge from control
gate. A dam has been
constructed to
surplus



Control gate in No. 3 levee
operating at capacity (4 ft.)

ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

DATE: 11-16 1940☒ MR. SALYER JS ☒☒ X ① ☒ ~~MRS. WOODIN~~ JS☒ X ☒ ~~MR. ELMER~~ JS☐ MRS. GARVIN JS☒ X ☒ ~~MR. DUMONT~~ DAD

SECTION OF HABITAT IMPROVEMENT:

~~Mr. Kubichek~~ PRH~~Mr. Smith~~ PRH~~Mr. Griffith~~ BEG~~Miss Cook~~ JWC

SECTION OF OPERATIONS:

~~Mr. Ball~~ JS☒ ~~Mr. Krummel~~ JSMrs. Watkins JSMrs. Kricun JS

SECTION OF ERA:

~~Mr. Regan~~ HXR~~Mr. Bourn~~ LOSMrs. Fishman JS☒ SECTION OF LAND MANAGEMENT: ☒~~Mr. Barnshaw~~ B~~Mr. Ackerman~~ JS

STENOGRAPHERS:

Miss Price JS~~Miss Whorley~~ VW☒ SECTION OF STRUCTURES:~~Mr. Taylor~~ WV~~Mr. Gustafson~~ JS

REMARKS:

Swan Lake Quarterly
August - October 1940Return to: Cook

SWAN LAKE NATIONAL WILDLIFE REFUGE
QUARTERLY NARRATIVE REPORT
AUGUST, SEPTEMBER, AND OCTOBER, 1940

gjd
I GENERAL

Principal activities at this station during the August-October (1940) quarter included supervision of share cropping activities, seed collection, construction of firebreaks, maintenance of levees, fencing, buildings, and disposal of surplus fire wood through special use permits.

950 bushels of ear corn were collected during the quarter toward filling the 1500 - 2000 bushel quota requested for this refuge. Approximately 1-1/2 tons of seed were collected for distribution during the 1941 planting program. The levee system for the upper pool, completed this fall, has been seeded to winter wheat and red top to prevent erosion. The No. 3 levee which will impound water in this unit has also been sodded to slough grass to establish a growth capable of resisting wave action.

Seventeen applications for firewood permits were received and forwarded for approval during the quarter and revenue collected from this source to October 31 totalled \$105.50.

The No. 3 levee was completed late in September and the upper unit or pool No. 1 is now ready for impounding water on the east bottoms.

A. Weather Conditions.

The weather during this period was extremely dry and temperatures above normal except during the month of August. Rainfall

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VW.

amounted to 7.53 inches during this period. The first frost occurred on September 26.

	<u>Rainfall</u>	<u>Max. Temp.</u>	<u>Min. Temp.</u>
August	4.57	99	51
September	.78	93	37
October	<u>2.18</u>	<u>88</u>	<u>37</u>
Total	7.53	Extreme 99	37

* Temperatures - St. Joseph Weather Bureau. Precipitation figures from Refuge records.

Rainfall during the corresponding period in 1939 totalled 6.39 inches. Weather conditions at this season are usually characterized by mild temperatures and light precipitation.

B. Water Conditions.

The No. 3 levee which was under construction during the summer months was completed in September and the upper pool is now ready for impounding water. No water has been impounded in this unit to date as the rainfall during recent weeks has been too light to cause an appreciable runoff in the refuge creeks. Our observations of weather conditions and discharge in Elk Creek indicate this watershed should have sufficient runoff to fill this pool to capacity during the late winter and spring months.

Water area on the project is now limited to the borrow pits along the levees and a marshy section in the upper pool known as Silver Lake which were flooded by the heavy rains in August.

C. Fires.

The dry weather conditions during September and October created the usual fall fire hazard on the refuge bottoms. Fire

breaks have been constructed along the refuge boundary at strategic points and nearby landowners, special use permittees, and CCC work crews have been cautioned regarding the fire hazard. A fire fighting detail has been organized at the CCC camp and equipment and crews are held in readiness for immediate transportation to the scene of fires. No fires occurred on the refuge during the period.

II WILDLIFE

A. Waterbirds.

1. Populations

a. Species

✓
Canada Goose (*Branta canadensis canadensis*)

First observed - October 4, 1940

Remarks - Small flocks 5-25 birds observed moving over during October. No concentration observed on refuge.

✓
Lesser snow goose (*Chen hyperborea hyperborea*)

Blue goose (*Chen caerulescens*)

Remarks - Several mixed flocks of these geese moved over during the period October 15-18, the first flock noted on October 15. This was a period of cold, clear weather, with northerly winds of 10-15 miles per hour. The largest flock observed contained about 300 birds. Blue geese outnumbered the snows about 3-1. About 500 birds were observed during this period.

✓
Common mallard (*Anas platyrhynchos*)

First observed as migrant - August 23, 1940

Remarks - Only small flocks observed to October 31. Flocks 10-15 birds noted on refuge borrow pits from time to time.

✓
Blue-winged teal (*Querquedula discors*)

First observed - August 23, 1940

Remarks - Only small flocks concentrated on area during latter part of September and through October. No large concentrations noted.

✓
Green-winged teal (*Nettion carolinense*)

First migration noted - October 21, 1940

Remarks - Only few scattered birds observed to date.

✓
American Widgeon (*Mareca americana*)

First migration - October 10, 1940

Remarks - Small number observed during October with other migrants.

✓
Shoveller (*Spatula clypeata*)

First observed - September 15, 1940

Remarks - Few scattered migrants observed to date.

✓
Wood duck (*Aix sponsa*)

Remarks - Observed in flocks of 10-20 on refuge creeks from August 24 - October 31. No large concentration observed.

✓
Ring-necked duck (*Nyroca collaris*)

First observed - October 11, 1940

Remarks - Few scattered birds observed among other migrants on refuge borrow pits.

The 1940 fall flight has been light to date and only a few small flocks of early migrants had appeared at the refuge by October 31. No large concentrations had occurred by that date, due in part, to the limited water area on the project and mild temperatures which have evidently delayed the main flight. A heavy flight and concentration are expected during November and early December as the refuge cornfields should attract thousands of pintails and mallards. Hunters contacted during patrol duty reported few birds were bagged between October 16 and 31 and it is evident that the main wave of migration will occur during the next few weeks.

B. Upland Game Birds. ✓

Prairie chickens began flocking in September and flocks of 5-30 birds are observed daily. The birds move in and out of the refuge area freely at this season and are frequently noted in

new winter wheat fields on nearby farms. Most of the local farmers take much interest in the birds and protect them from illegal hunting.

The number of birds on the refuge at present is estimated at 100 and this will probably increase to 250 during the winter months when the chickens return from nearby farms to feed in the refuge cane and corn fields.

The refuge bob ~~white~~ population has increased to about 500 birds, as weather conditions were favorable during the nesting season. Cane fields planted over the refuge will provide an abundant supply of winter feed for these birds and wintering losses should be light.

A few pheasants are seen from time to time in the refuge bottoms but have not nested to our knowledge. The number of birds on the area is estimated at 10.

III REFUGE DEVELOPMENT AND MAINTAINENCE

The No. 3 levee, which was under construction during the summer months, was completed in September and the upper pool will be flooded as soon as there is sufficient runoff from the Elk Creek watershed. Completion of the water retaining structures for this unit has made it possible to impound water on the area for the first time. The pool will be partially filled during the next year to allow for settling of the levees and establishment of a protective growth on the pool slope.

Excavation for the lower spillway, which will discharge flood water from the refuge pools into Grand River, was completed

during the quarter. Approximately 20,000 yards of dirt were moved by the CCC equipment on this project. The necessary rip rapping for the structure is now in progress and will be completed during the winter months.

Additional construction completed by the CCC during the quarter included the laying of sidewalks at the headquarters site and erection of a 36 foot flagpole on the office lawn. Construction was also started on the water supply system for the secondary headquarters. Construction of the levee from the headquarters site across the Swan Lake bottom to the Mendon-Summer Highway was started in October and this dike will be finished within 6-9 months. Completion of this levee will provide a road direct to refuge headquarters from the highway and eliminate use of the old trail and a hazardous railroad crossing now affording the only access to this site.

The trail from the headquarters site to the lower spillway was surfaced with crushed rock to provide access to this site for the construction crews during the winter.

Three miles of line fencing were repaired and wires tightened and all boundary markers were straightened and painted. This maintenance was done by the Refuge Patrolman.

B. Plantings.

Observations of the areas where plantings of marsh and aquatic vegetation were made during the spring months indicate that only native stock (*Polygonum pennsylvanicum* and *Echinocloa crus-galli*) had a satisfactory growth. Experimental plantings of

Potamogeton pectinatus and Nais flexilis seed did not establish a growth this season. It is believed the large amount of silt and temperatures of the water in the borrow pits where the plantings were attempted were unfavorable for the growth of these forms. Next season's observations will indicate whether the lack of growth was due in part to delayed germination.

Trees and Shrubs

<u>Species</u>	<u>No.</u>	<u>Location</u>	<u>Survival</u>	<u>Cause of loss</u>
Crataegus sp.	365	NE $\frac{1}{4}$ NW $\frac{1}{4}$ S. 2, T. 55 N., R. 21 W.	25% ✓	drouth ✓
Celtis				
occidentalis	3000	"	50% ✓	"
Lespedeza bicolor	10000	"	" ✓	"
Morus alba				
tatarica	6000	"	" ✓	"
Prunus serotina	5000	"	" ✓	"
Vitis sp.	1500	"	" ✓	"
Prunus americana	2610	"	" ✓	"
Juniperus				
virginiana	500	"	75% ✓	"

Grasses

2nd Section

The No. 3 levee of the upper pool was sodded to Spartina pectinata and Panicum virgatum to establish a growth capable of resisting wave action.

C. Collections.

<u>Species</u>	<u>Stock</u>	<u>Quantity</u>	<u>Cost</u>
Polygonum sp.			
(mostly pennsylvanicum)	Seed	3200 lbs. ✓	1 $\frac{1}{2}$ lb. ✓
Echinocloa crus-galli	Seed	150 lbs. /	10 $\frac{1}{2}$ lb. ✓

This stock was collected by combining (smartweed) and CCC labor (millet) and the seed was dried by spreading the material

about 2 inches deep on the floor of the loft at the refuge granary and stirring with rakes to prevent heating and mold.

IV PUBLIC RELATIONS

About 500 visitors inspected the refuge during the fall most of whom were residents of nearby cities who drove out to the area on weekends to view the work projects and headquarters buildings. Visitors are permitted to view the refuge from the observation towers and are given all possible information regarding the project by refuge personnel.

A feature writer for the Kansas City Star also visited the refuge in October to obtain snapshots of the water control structures and notes on use of the area by waterfowl and other wildlife. These will appear in an early issue of the paper.

Official visitors at the refuge included Mr. F. C. Gillett, Refuge Inspector; Mr. Janzen, Assistant Regional Director; Mr. Vroman, CCC Inspector; and Mr. W. E. Hall, District Engineer.

State Conservation officials visiting the area included Agents McKinney, Bickel, Green, and Johnson.

V ECONOMIC USES OF REFUGE

A. Grazing.

One grazing permit was issued involving the leasing of 240 acres of pasture for 92 animal months use and a first installment of \$23.00 was collected on this permit in October. All grazing will be confined to a small unit, separated from the main body of the refuge by a public highway. A charge of 50¢ per head

per month was assessed for grazing privileges in compliance with the mater plan approved for the refuge.

B. Haying.

Hay harvested under two previously issued permits measured $34\frac{1}{2}$ tons and final collections amounting to \$9.50 were obtained. Two grass seed harvesting permits were approved for harvesting $37\frac{1}{2}$ bushels of timothy seed and approximately 50 bushels of lespedeza and collections on these permits totalled \$28.75.

C. Timber Removal.

180 cords of firewood were sold to local residents during the quarter. This material consisted chiefly of trimmings and slash left by CCC crews cutting saw logs and clearing the upper pool site. The permittees were required to saw and haul the wood at their own expense and purchased the material at a cost in line with local firewood prices. The total amount of revenue collected from this source to October 31 was \$105.50.

D. Cooperative Farming.

Four cooperative farming permits were approved during the quarter for the use of 225 acres for share cropping purposes during the 1941 season. Crops to be raised under these permits include 150 acres of winter wheat, 50 acres of corn and 25 acres of millet.

Refuge tenants are now engaged in harvesting this season's corn crop on the refuge farming units and 950 bushels of ear corn were collected by October 31. The yield is somewhat light due to drouth conditions and the average will be about 35 bushels. The cane crops planted by a number of permittees for the refuge share have yielded well and about 80 acres of Grohoma and hegari will be left in the field for feeding purposes. Cane fields are favorite feeding areas for the prairie chickens wintering on the

refuge and the birds are already feeding extensively in these food patches.

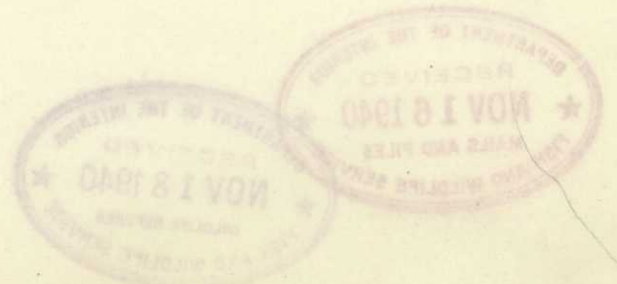
Approximately 60 acres of corn will be left in the field for feeding purposes and 2000 bushels of harvested corn will be collected this season.

VI OTHER ITEMS

The land acquisition program is now complete except for the purchase of the 60 foot right of way from the Swan Lake tract to the Summer highway and other minor items and these details will be completed in the near future.

Kenneth L. Krumm
(Signature)

Jr. Refuge Manager
(Title)



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The land acquisition program is now complete except for the purchase of the 80 foot right of way from the Swan Lake tract to the Summer highway and other minor items and these details will be completed in the near future.

James H. Thompson
(Signature)
J. H. Thompson
(Title)



ROUTING SLIP

DIVISION OF WILDLIFE REFUGES

DATE: 8-16-1940

X ✓ MR. SALYER JCS ✓ SECTION OF HABITAT IMPROVEMENT:
 ① ✓ ~~MRS. WOODIN~~ Rhe Mr. Kubichek _____
 ✓ ~~MR. ELMER~~ ACE ✓ ~~Mr. Smith~~ RHA
 _____ MRS. GARVIN _____ Mr. Griffith REG
 ✓ ~~MR. DUMONT~~ PAO Miss Cook dmc

✓ SECTION OF OPERATIONS:

✓ SECTION OF ERA:

✓ ~~Mr. Ball~~ _____
 ✓ ~~Mr. K...~~ WK ~~Mr. Regan~~ JHR
 Mrs. Watkins _____ Dr. Bourn WSB
 Mrs. Kricun _____ Mrs. Fishman _____
 _____ _____
 _____ _____

✓ SECTION OF LAND MANAGEMENT:

✓ STENOGRAPHERS:

✓ ~~Mr. Barnshaw~~ B Miss Price _____
 ✓ ~~Mr. L...~~ wa ~~Miss Whorley~~ V.W.

✓ SECTION OF STRUCTURES:

✓ ~~Mr. Taylor~~ WVT
 ✓ ~~Mr. Carlson~~ RLH

REMARKS:

Swan Lake Quarterly Report
May-July 1940

Return to: F. Cook

IN REPLY REFER TO

Swan Lake
Narrative Report

UNITED STATES
DEPARTMENT OF THE INTERIOR

~~BUREAU OF BIOLOGICAL SURVEY~~

FISH AND WILDLIFE SERVICE
500 National Building
Minneapolis, Minnesota

August 24, 1940

Director, Fish and Wildlife Service

Washington, D. C.

Dear Sir:

There is enclosed quarterly narrative report for
the Swan Lake National Wildlife Refuge, submitted by Mr.
Kenneth K. Krumm, for the quarter ending July 31, 1940.

Ball
Quarterly grain report for the same period is also
attached.

Very truly yours,

F. C. Gillett
as.

F. C. Gillett
Refuge Inspector

Enc.





ENC.

Respectfully,
B. C. Gillett

B. C. Gillett
Very truly yours,

Enclosed.

Enclosed is a report for the same period as also
Kennerly's report for the quarter ending July 31, 1940.
The same Lake National Wildlife Refuge, approved by H.

There is enclosed separately heretofore report for
Dear Sir:

Washington, D. C.

Director, Fish and Wildlife Service

August 14, 1940

Minneapolis, Minnesota
200 National Building
Fish and Wildlife Service
Bureau of Conservation

DEPARTMENT OF THE INTERIOR
UNITED STATES

Heretofore report
same date
in letter dated 10

IN REPLY REFER TO

Swan Lake
Narrative Report

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF BIOLOGICAL SURVEY

FISH AND WILDLIFE SERVICE
500 National Building
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August 14, 1940

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Quarterly grain report for the same period is also attached.

Very truly yours,

F. C. Gillett
Refuge Inspector

Enc.



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF BIOLOGICAL SURVEY

Swan Lake
Narrative Report

FISH AND WILDLIFE SERVICE
500 National Building
Minneapolis, Minnesota

August 24, 1940

Director, Fish and Wildlife Service

Washington, D. C.

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the Swan Lake National Wildlife Refuge, submitted by Mr.
Kenneth K. Kram, for the quarter ending July 31, 1940.
Quarterly grain report for the same period is also

attached.

Very truly yours,

F. C. Gillett
Refuge Inspector

Enc.



SWAN LAKE NATIONAL WILDLIFE REFUGE
QUARTERLY NARRATIVE REPORT
MAY, JUNE, AND JULY, 1940

I GENERAL

The principal refuge activities at this station during the quarter ending July 31 included the planting of additional food and cover, sodding recently constructed sections of refuge levees to prevent erosion, supervision of farming activities by special use permittees, maintenance of fencing and grounds and buildings at the two headquarters sites, and patrol.

A. Weather Conditions

Weather Record

	Rainfall	Max. Temp.	Min. Temp.
May	2.00	no data	no data
June	3.50	95° F	55° F
July	1.66	103° F	61° F
Total	<u>7.16</u>		

Weather conditions during this quarter were in general similar to those of the corresponding period of last season, although rainfall was less. Rainfall during this quarter amounted to 7.16 inches and precipitation during the period May-July 1939 amounted to 11.20 inches. The late spring and early summer months in this section of the state are generally characterized by high temperatures and light to moderate precipitation and many of the shallower lakes and streams which are filled by the spring rains dry up at this season.

B. Water Conditions

The water retaining structures for the upper pool are nearing completion at this time and it is expected that the levees for this unit will be finished by October 1. No water has been impounded on the refuge to date and the only existing water areas are the borrow pits and a small marshy area known as Silver Lake in Section 33, Township 56 N., Range 20 W. The total water area on the project at present is about 50 acres as most of the small lakes and sloughs on the area dry up by July 1. The runoff in the two creeks (Elk and Turkey) which will feed the refuge units varied from a trace to 100 cfs. During the corresponding period of 1939 - the runoff varied from a trace to 740 cfs, as heavy rains occurring on June 20-21, 1939, of that year

*gwc
V.W.*

resulted in a heavy runoff in the refuge creeks during the latter part of the month. Present indications are that Elk Creek will have sufficient runoff to fill the refuge pools during the spring and fall although the water level will undoubtedly recede considerably during the summer months due to drouth conditions prevalent during the average season.

C. Fires

No fires occurred on the area during the quarter as this is the only season in which the vegetation on the refuge bottoms will not take fire readily. The period of greatest fire hazard extends from September 1 to May 1 and arrangements have been effected whereby fires of ordinary proportion can be promptly extinguished by CCC crews under the direction of refuge personnel.

II WILDLIFE

A. Waterbirds

1. Populations and behavior

The common mallard and wood duck were the only species of waterfowl observed on the refuge during the nesting season this year. A single brood (6) of mallards was noted on the refuge during July and four broods of wood ducks were noted during June on potholes along Yellow Creek. The number of wood ducks nesting on the area this season was estimated at 15 pairs. The king rail is a common summer resident and nesting bird and a considerable number of young birds were observed on refuge sloughs and along old borrow pits. A few coots remained on Silver Lake during the summer but no nests or young were observed. A few sora rail were also noted during this period but no nesting records were obtained.

Of the shore birds, only the Killdeer was observed as a summer resident and nesting bird this season, one pair nesting on the residence lawn at the Refuge Headquarters during May.

a. Herons and Bitterns

Great Blue Heron (*Ardea herodias herodias*)
Summer resident

Green Heron (*Butorides virescens virescens*)
Common summer resident and nesting bird.

Black-crowned Night Heron (*Nycticorax nycticorax hoactli*)
Summer resident--Common

American Bittern (*Botaurus lentiginus*)
Common summer resident and nesting bird.

b. Waterfowl

Common Mallard (*Anas platyrhynchos*)
Summer resident. A few birds remain through summer. Single brood of 6 observed on several occasions during month of July.

Wood Duck (*Aix sponsa*)
4 broods-average size-7-observed along Yellow Creek on woodland potholes. Common summer resident and nesting bird. Estimate 10-15 pairs nesting on refuge this season.

c. Shorebirds

Killdeer (*Oxyechus vociferus vociferus*)
Common summer resident and nesting bird. One nest-three eggs-on headquarters lawn, May, 1940.

d. Rails

King Rail (*Rallus elegans elegans*)
Common summer resident and nesting bird. Estimate 100 pairs nested on area this season.

Sora Rail (*Porzana carolina*)
Summer resident. No nesting record.

American Coot (*Fulica americana*)
A few birds remain through summer months. No nesting record.

B. Upland-game Birds

1. Populations and behavior

a. Greater Prairie Chicken (*Tympanuchus cupido americanus*)
Prairie chickens are on the increase at the refuge and the number of birds on the area

is estimated at 200. The dry weather during the nesting season apparently favored the hatch and a number of broods, averaging about 10 each were observed. The main booming ground on the refuge is situated on a knoll about 1/4 mile southeast of the headquarters observation tower and the birds appeared there daily from the latter part of February to June 1. The birds are usually observed on refuge trails or open areas where the vegetation is short and nests observed were in open meadows, in grass or stubble less than 6 inches in height. Little or no attempt is made to conceal the nests. The nesting season extends from the latter part of April to mid-June. A flock of 9 nearly full grown birds, evidently hatched near the headquarters site, appear nearly every day on the headquarters courtyard and on one occasion these birds were observed on the lawn of the service building, two of the birds walking past the office windows within a few feet of the building. This species is apparently not attacked to any extent by predators although coyotes, foxes, mink, coon, and hawks have concentrated on the refuge in some numbers.

✓
b. Bob-white (*Colinus virginianus virginianus*)

The recent nesting season has been very favorable for this species and the refuge bob-white population is estimated at 500 birds, a heavy increase over last year. A reasonably accurate estimate of brood sizes is not possible because of the dense cover at this season, but in general the broods observed this summer are larger than average, 22 birds being counted in one brood. Several other broods observed during the summer contained 12-18 young birds.

✓
c. Ring-necked Pheasant (*Phasianus colchicus torquatus*)

A small number of pheasants are present on the refuge (population estimated at 10 birds) and single birds or pairs are occasionally observed on the bottoms. No young birds have been noted and the adults are apparently not nesting. This species has not been propagated with any degree of success in this section of the state.

C. (Omit)

D. Fur-bearing Animals, Predators, Rodents

1. Populations

Fur bearers observed on the area include Opossum, skunk, civet cat, muskrat, mink, raccoon, red fox, and northern coyote. These species have exhibited an increase in number, with the exception of the red fox which is not common. Some control measures may be necessary to reduce the coyote population during the coming winter as at least four litters of young were raised in dens on the refuge and the animals are frequently heard at night near the two headquarters sites. Rabbits, mice, crayfish, an occasional gopher and small birds are the chief items of diet for predators on the refuge, judging from the contents of scats examined in the field. Skunks may be numerous enough to warrant trapping during the coming fall. Muskrat, mink, and raccoon will probably not be numerous enough to warrant removal of surplus fur for at least 3 years. Game bird populations have apparently not been attacked to any extent by predators though remains of quail and prairie chickens have been noted in the field on infrequent occasions.

The Franklin's ground squirrel is fairly common along refuge trails and old levees. Fox Squirrels are abundant and a few gray and flying squirrels are also present in the timbered bottomlands along the refuge creeks. Cottontail rabbits (*Sylvilagus floridanus mearnsii*) are plentiful and the annual increase has so far been sufficient to keep the population at the same level despite the fact that many of the animals are taken by owls, coyotes and other predators.

E. Fish

Conditions for fish life on the refuge are unfavorable at present as the available water area is confined to shallow potholes, small lakes, and borrow pits, most of which dry up during the summer months. Species of fish observed on the refuge area include bullhead (*Ameiurus* spp.), channel cat (*Ictalurus* spp.), drum (*Aplodinotus grunniens*), carp (*Cyprinus carpio*), buffalo (*Ictiobus bubalus*), crappie (*Pomoxis annulatus*) and gar. All carp, buffalo and gar will be removed from the deeper borrow pits prior to flooding the upper lake.

The refuge borrow pits are periodically stocked with the species listed by spring floods although usually only the bullheads, carp, buffalo, and gar are able to survive in the shallow, warm water during the summer months.

III REFUGE DEVELOPMENT AND MAINTAINENCE

A. Physical Development

The water control structures and levees for the upper pool are nearing completion and it is expected that this unit will be finished by October 1. The two draglines operated by the CCC Camp are now closing in the last section of the No. 3 levee from the upper spillway to Elk Creek, a distance of approximately 3/4 mile. Upon completion of this section of the system, the creek channel will be filled to impound the runoff during the winter and spring months. Approximately 2-1/2 miles of the levee system for this pool have been graded, low spots filled in and a 12 ft. road bed constructed along the top of the dike for patrol purposes. The average size of the crews assigned to these projects was 20, including machine operators, oilers, and foremen.

Riprapping at the spillway and control gate in the levee system of the upper unit was completed during the quarter.

Approximately 100,000 feet of Wakefield piling were sawed from timber cut during the winter months by CCC crews. This material will be transferred to other stations for repair of levees. The project was carried out through use of CCC labor and funds, a local sawrig being hired for sawing the timber and the Camp furnishing the required labor. A 15 man crew was assigned to this project.

The courtyard at the Primary Headquarters was given a final application of crushed rock and the site given a final cleanup to clear away remaining debris and unused construction material. Electrical fixtures and parkway cable required to provide current for the Primary Headquarters buildings were installed and placed in operation.

A vacant grainary and storage shed on tract 75 was repaired and remodeled to provide adequate storage space for refuge farming equipment and bins for grain collected from farming cooperators. A compartment was provided in the structure for storage of boats and this building will provide storage for all refuge equipment. All boats and farm machinery on hand at the refuge are now being stored in this building.

B. Plantings

Aquatic and marsh vegetation planted during the quarter included 400 lbs. of sago pondweed (*Potamogeton pectinatus*) and 50 lbs. of bushy pondweed (*Najas flexilis*) seed, 1300 lbs. of ✓

smartweed seed and 350[✓] lbs. of wild millet. Only a small percentage of the pondweed seed germinated this season, as water conditions in the borrow pits became unfavorable for the growth of these species. All water areas in this section of the state are in a perpetually muddy, roily, condition and this factor together with extreme variations in temperature and receding water levels possibly affected the germination and growth of the seed.

The smartweed and wild millet seed was planted in two dry lake beds and an excellent growth was secured of these two species.

Aquatic Plantings

Species	Date	Location	Amount
Potamogeton pectinatus	May 9, 1940	borrow pit SE ¹ / ₄ SE ¹ / ₄ SE ¹ / ₄ Sec. 5, T. 55 N., R. 20 W. and NW ¹ / ₄ NW ¹ / ₄ NE ¹ / ₄ Sec. 8, T. 55 N., R. 20 W. borrow pit	400 [✓] lbs. seed
Nais flexilis	May 9, 1940	borrow pit NW ¹ / ₄ NW ¹ / ₄ NE ¹ / ₄ Sec. 2, T. 55 N., R. 20 W.	50 [✓] lbs. seed
Polygonum pennsylvanicum	July 3, 1940	Lake bed NW ¹ / ₄ NW ¹ / ₄ Sec. 36, T. 56 N., R. 21 W., and NW ¹ / ₄ NW ¹ / ₄ Sec 1, T. 55 N., R. 21 W.	1300 [✓] lbs. seed
Echinocloa crus-galli	July 3, 1940	Same location	350 [✓] lbs. seed

*Planting of Echinocloa and Polygonum deferred until lake beds dried. ^{ok} R2G

C. Collections Listed in report for preceding quarter.

D. Distribution Listed in report for preceding quarter.

IV PUBLIC RELATIONS

A. Recreational Uses

1. Recreation

As the land acquisition and development programs are not completed, no recreational facilities have been provided to date. Sites have been selected for camping and picnic grounds on the Big Swan Lake Tract, 1-1/2 miles north of the Headquarters Site and a recreational area will be developed in a small timbered area along the north shore of the lake adjacent to the refuge entrance. This area is well suited for this purpose as this site is situated in the extreme northwest corner of the refuge and can be set aside for public use without undue disturbance to wildlife or creation of a fire hazard.

4. Visitors

Regional Officials inspecting the refuge this quarter included Mr. Maurek and Messers. Gillett, Vroman and Hall of the New Regional Office, Mr. A. F. Miller, and Mr. J. C. Hedrick. State Conservation officials visiting the area included Agents McKinney, Bickel, Jognson, and Green, with whom refuge personnel cooperated in patrolling areas adjacent to the project.

Approximately 300 visitors have inspected the project since May 1, chiefly on Sundays although a few appeared during the week. Although no water has been impounded on the refuge and recreational facilities are not yet available, the local public exhibits considerable interest in the refuge and visitors from points as distant as 120 miles frequently appear at the refuge on weekends to inspect the area.

B. Violations

No violations occurred on the area during the quarter. Licenses of several parties hunting or fishing in areas immediately adjacent to the refuge were checked by refuge personnel while on patrol. The two towers erected at the Primary and Secondary Headquarters Sites have considerable psychological value as an aid in preventing violations as most of the adjacent hunting clubs and landowners are apparently of the opinion that observers equipped with powerful glasses and searchlights are stationed on the structures at all times, according to local tradition.

V ECONOMIC USES OF REFUGE

A. Haying

One haying permit, authorizing harvesting and removal of hay on a 10 acre tract was issued during the quarter. The approximate yield and revenue are expected to be about 15 tons and \$15.00 after haying activities are completed by the permittee and the crop is measured.

B. Timber Removal

Timber removal during the quarter was confined to the cutting of 200 white oak posts for use at the Squaw Creek Refuge. Approximately 100,000 feet of piling were sawed from timber cleared on the upper pool site during the winter months.

C. Cooperative Farming

Six cooperative farming permits involving the use of approximately ~~34~~ 349 acres of refuge land for farming purposes were issued during this period. Crops planted included corn, hegari, grohoma, and soy beans. Approximately 115 acres of this acreage will be retained by the refuge for feeding purposes. The recent drouth will undoubtedly affect the yield this season as about 20% of the corn crop was fired by the extreme heat in July. The acreage planted this season should provide an adequate amount of feed during the fall and spring flights despite the fact that the crop will be rather light.

VI OTHER ITEMS

The land acquisition program for the refuge is nearing completion at this time and the Government now holds title to all property within the present boundary of the project except two small tracts (200 a and b) comprising about 1-1/2 acres and the Swan Lake property north of the headquarters site which will probably be acquired by the first of the year.

The No. 3 levee of the upper pool system was sodded with Spartina during this period to secure a growth on the slope which will check erosion and wave action. The remaining levee (No. 1) will also be planted in this manner as soon as the fall rains begin.

The personally owned camera in use at this station has not proved satisfactory for securing wildlife photographs. A number of snapshots were taken on personal film with the intention of submitting the best pictures with this report. Several snapshots taken of wood duck and

related subjects proved unsatisfactory and no pictures have been submitted with this report. New equipment will be secured during the coming quarter to obtain satisfactory photographs for official use.

Kenneth R. Krumm

Jr. Refuge Manager



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James H. Brown

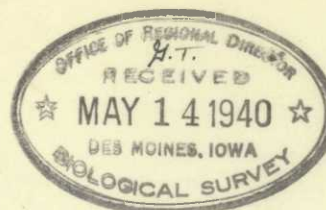
Jr. Refuge Manager



NARRATIVE REPORT

SWAN LAKE REFUGE

FEBRUARY - APRIL, 1940

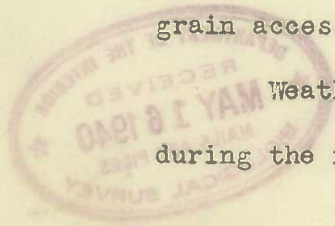


The principal field activities at this refuge during the February-April quarter included planning and administration of our 1940 cooperative farming program, supervision of CCC projects, including food and cover planting, seeding of the levees, landscaping, distribution of surplus seed to other refuges, management of feeding areas provided by our 1939 farming program, and activities in connection with refuge publicity and public relations planned by the Washington office.

23,975 trees and shrubs were planted during April by CCC crews to improve existing food and cover, most of the planting being confined to recently acquired tracts where cover had been destroyed by grazing, burning, and farming activities.

100 ten-foot elm and ash were dug and transplanted in the courtyards at the headquarters site and patrolman's quarters. 4,000 pounds of seed, collected at the refuge last fall were distributed to other refuges for spring planting. Completed sections of the No. one and three levees have been seeded to prevent erosion pending completion of sodding and riprap projects. Cornfields left on the area were husked or dragged to make the grain accessible to waterfowl concentrating on the area.

Weather conditions in this area were unusually severe during the recent spring months, temperatures ranging below normal



v.w.



NARRATIVE REPORT

SWAN LAKE REFUGE

FEBRUARY - APRIL, 1940

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Weather conditions in this area were unusually severe recent spring months, temperatures ranging below normal



much of the time. Precipitation was sufficient to fill the refuge lakes and sloughs and the available water area, together with grain left in the field, provided adequate resting and feeding grounds for the heaviest concentration of waterfowl since the project was established.

The 1940 spring flight was the largest observed at this refuge since the project was established, at least 75,000 birds concentrating on the area during the height of the migration, which occurred between March 10 and 25th. Refuge cornfields provided an abundant source of food for the birds and an interesting observation in connection with feeding activities this spring was the fact that nearly all feeding occurred within the refuge boundaries, several local farmers advising that few or no birds were observed in their winter wheat and cornfields this year. On one occasion the refuge patrolman and writer were able to make a reasonably accurate estimate of the number of birds feeding in an 80-acre field a short distance east of the headquarters buildings through observation of the flocks passing the tower during a $1\frac{1}{2}$ hour period. The number of birds feeding in this one area was estimated at 30,000, chiefly mallards and pintails, with a scattering of widgeon, teal, and approximately 2,500 blue and snow geese.

Our 1939 cooperative farming program proved very successful as a means of providing adequate feed for birds concentrating on the area. Last season, snow and blue geese which concentrated here

fed almost exclusively in wheat fields outside the refuge and large flocks of ducks were observed daily on adjacent farmlands. This year nearly all feeding was confined to the refuge, which aroused favorable comment among local residents. Corn left standing in refuge fields was dragged or husked out and the stalks broken to make the ears accessible and the grain was cleaned up with very little waste. A small amount of feed was left in the vicinity of hedge rows or timber, which the birds apparently avoided. Our observations indicate that the birds will not feed readily in standing corn even though a substantial share of the ears have fallen to the ground.

Migration records for the spring flight with dates of arrival and departure, and estimated numbers are as follows:

Common mallard (*Anas platyrhynchos*)

First observed as migrant - February 17, 1940
Period maximum abundance - March 10-25, est, 25,000
birds present
Last noted as migrant - April 30, 1940
Remarks: Ranked next to the pintail in number. Fed extensively in refuge cornfields.

Black duck (*Anas rubripes*)

First migration - March 1, 1940
Remarks: Observed in small numbers among flocks of common mallard.

Pintail (*Dafila acuta tzitzihua*)

First migration - February 16, 1940
Period maximum abundance - Feb. 21-Mar. 1 - 8,000 and
Mar. 10-Mar. 25 - 30,000
Last observed as migrant - April 28, 1940
Remarks: Most abundant of migrants this spring, large flocks feeding in refuge cornfields during latter half of March.



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 First migration - March 1, 1940
 Remarks: Observed in small numbers among flocks of common mallard.

Pintail (Dafila acuta taitzinhos)
 First migration - February 16, 1940
 Period maximum abundance - Feb. 21-Mar. 1 - 8,000 and
 Mar. 10-Mar. 25 - 30,000
 Last observed as migrant - April 28, 1940
 Remarks: Most abundant of migrants this spring, large flocks feeding in refuge cornfields during latter half of March.



✓
Blue-winged teal (*Querquedula discors*)

First migration - March 17, 1940
Period of maximum abundance - Apr. 10-20 - 2,000 birds
- present on area
Remarks: Flight over by April 25 although a few stragglers remained during first week of May.

✓
Green-winged teal (*Nettion acrolinense*)

First migration - February 29, 1940
Period of maximum abundance and number - March 17-30 - 500 birds
- on area
Last observed - April 28, 1940

✓
Wood duck (*Aix sponsa*)

Only record - April 25, 1940

✓
Shoveler (*Spatula clypeata*)

First migration - March 10, 1940
Height of migration - March 20-Apr. 5 - estimate
- 1,000 birds on area
Last noted as migrant - April 25, 1940
Remarks: Common migrant observed in some numbers around margins of shallow pools.

✓ *Barely there*
American widgeon (*Mareca americana*)

First migration - March 9, 1940
Period maximum abundance - Mar. 25-Apr. 5, 1940, 1500
- birds present on area
Last observed as migrant - Apr. 27, 1940
Remarks: Common migrant and observed feeding in some numbers in refuge cornfields with mallards and pintails.

✓
Gadwall (*Chaulelasmus streperus*)

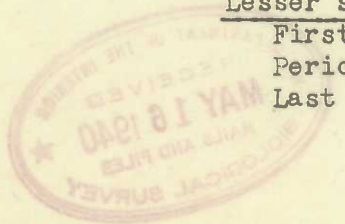
First migration - March 10, 1940
Remarks: Few small flocks and individuals observed from March 10 - 17 but this species is an uncommon migrant in this section.

✓
Redhead (*Nyroca americana*)

Only record - March 17, 1940
Remarks: An uncommon migrant.

✓
Lesser scaup (*Nyroca affinis*)

First migration - March 6, 1940
Period maximum abundance - Mar. 15-Apr. 1 - 1000 birds
Last observed - April 20, 1940.



Blue-winged teal (Querquedula discors)
 First migration - March 17, 1940
 Period of maximum abundance - Apr. 10-20 - 2,000 birds
 - present on area
 Remarks: Flight over by April 25 although a few stragglers remained during first week of May.

Green-winged teal (Nettion carolinense)
 First migration - February 28, 1940
 Period of maximum abundance and number - March 17-30 - 500 birds
 - on area
 Last observed - April 28, 1940

Wood duck (Aix sponsa)
 Only record - April 25, 1940

Shoveler (Spatula clypeata)
 First migration - March 10, 1940
 Height of migration - March 20-Apr. 5 - estimate
 - 1,000 birds on area
 Last noted as migrant - April 25, 1940
 Remarks: Common migrant observed in some numbers around margins of shallow pools.

American widgeon (Marca americana)
 First migration - March 9, 1940
 Period maximum abundance - Mar. 25-Apr. 5, 1940, 1500
 - birds present on area
 Last observed as migrant - Apr. 27, 1940
 Remarks: Common migrant and observed feeding in some numbers in refuge cornfields with mallards and pintails.

Gadwall (Chenaleasmus streperus)
 First migration - March 10, 1940
 Remarks: Few small flocks and individuals observed from March 10 - 17 but this species is an uncommon migrant in this section.

Redhead (Aythya americana)
 Only record - March 17, 1940
 Remarks: An uncommon migrant.

Lesser scaup (Aythya affinis)
 First migration - March 6, 1940
 Period maximum abundance - Mar. 15-Apr. 1 - 1000 birds
 Last observed - April 20, 1940.



✓
Ring-necked duck (Nyroca collaris)

First migration - March 6, 1940
Period maximum abundance - Mar. 17 - Apr. 5 - 1,000
birds present on area.

✓
Canada goose (Branta canadensis canadensis)

First migration - April 3, 1940
Period maximum abundance - Apr. 7-15, 1940 - 200 birds
- present on area
Last observed as migrant - April 22, 1940
Remarks: A few small flocks of Canada geese were
observed during April 7 - 15, passing through
in flocks of 20 - 200.

✓
Lesser snow goose (Chen hyperborea hyperborea)

First migration - March 13, 1940, a few
- scattered birds appeared
- among flocks of blue geese
Height of migration - Mar. 17-25, 1940 - 500 birds
Last observed - April 21, 1940.

✓
Blue goose (Chen caerulescens)

First migration - March 10, 1940, flock of 16
birds noted on Big Swan Lake.
Weather cloudy, cold, wind
East, velocity 18 mi./ temperature ranging from minimum of
30° to maximum of 42° through
this section of state.

Increase - March 12-15 to 2,500 birds.

Period of maximum abundance-March 15-March 28, estimate
2,500 birds present on area,
feeding in refuge cornfields
about 6-9 A.M. and 4:15-5:30
P.M., resting on lakes during
day. On March 17, the heaviest
wave of migration passed through
this section - many flocks of
50-500 birds noted moving
northward from 10 A.M. to 4 P.M.
at an altitude estimated at
3500 feet. This was an un-
seasonably mild day, the
temperature reaching a high of
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in flocks of 20 - 200. observed during April 7 - 16, passing through Remarks: A few small flocks of Canada geese were Last observed as migrant - April 22, 1940 - present on area - Apr. 7-15, 1940 - 200 birds First migration Canada goose (Branta canadensis canadensis)

birds present on area. Period maximum abundance - Mar. 17 - Apr. 5 - 1,000 First migration Ring-necked duck (Aythya collaris)

Waning of migration - Between March 28-April 4 small flocks left daily until only about 100 birds were present on April 4th. A few stragglers remained to feed in refuge cornfields until April 21.

Last observed - April 21, 1940.

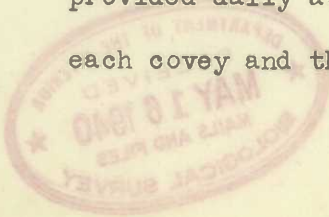
Remarks: The flight was about the same as that of 1939, and the dates of migration were approximately the same.

Upland Game

About 200 prairie chickens wintered on the area this season, and the refuge cornfields provided an abundance of feed for these birds during the severe winter weather experienced this year.

The birds began booming in mid-February, the main booming grounds being situated in a lespedeza field about 400 yards east of the refuge headquarters. During February and early March, small flocks were observed from time to time in the trees near the buildings, apparently little disturbed by the presence of work crews from the CCC camp. Cornstalks along the margins of the refuge fields were broken to make the ears accessible during periods of deep snow and sleet and flocks of 30-100 birds fed daily within a half mile radius of the headquarters site.

The refuge bob-white population, estimated at 200 birds, apparently survived the severe winter in good condition. Feed was provided daily at leanto shelters constructed within the range of each covey and the birds also used the refuge cornfields to



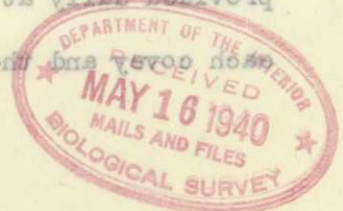
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advantage during the deep snows. A small number of pheasants are also present on the area but it is doubtful if these birds are nesting, or if so, that the young are surviving as only a few adult birds have been observed at all seasons. A single bird was recently observed in the courtyard at the refuge headquarters and two to three birds have been noted from time to time in the refuge bottoms. The number present on the refuge probably does not exceed six or eight.

Predator and Rodent Control

Hawks and owls were abundant during the late winter and early spring and Cooper's hawks were observed attacking or harrying quail on a few occasions although no actual captures of bob-white were witnessed. On one occasion a hawk was noted in a feeding shelter and in a few instances, Cooper's hawks were observed molesting individual covies. A .410 gauge shotgun proved effective in discouraging these predators in instances where covies were apparently being harried for periods of several days.

REFUGE DEVELOPMENT & MAINTENANCE

Plantings

23,975 trees and shrubs were set out during April, most of the planting being confined to the 400-acre headquarters tract which had been cropped and used for pasturing feeder cattle until the fall of 1939, resulting in almost complete destruction of trees



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and shrubbery on the area. Species and quantities planted included 365 Crataegus sp., 3,000 Celtis occidentalis, 1,500 Vitis sp., 10,000 Lespedeza bicolor, 2,610 Prunus americana, 1,000 Morus alba tatarica, 5,000 Prunus serotian, and 500 Juniperus virginiana. m

This stock was obtained through transfer from SCS nurseries at Elsberry, Missouri, Manhattan, Kansas, and Winona, Minnesota. The plantings have exhibited a very satisfactory survival (approximately 75%) and growth to date.

Distribution of Seed and Nursery Stock

Following is a record of seed and nursery stock received at this station for the spring planting program:

<u>Species</u>	<u>Amount</u>	<u>Source</u>	<u>Date Rec'd</u>	<u>Delivery</u>
Sago pondweed ✓	400 lbs.	Bear River MW Refuge	2/20/40	Freight
Bushy pondweed ✓	100 "	Tamarac Refuge	2/22/40	"
Crataegus sp.	365 ✓	SCS, Manhattan, Kan.	4/1/40	Express
C. occidentalis	3000 ✓	" "	"	"
Lespedeza bicolor	5000 ✓	SCS, Elsberry, Mo.	3/27/40	"
Morus alba tatarica	1000 ✓	" "	"	"
Prunus serotina	5000 ✓	" "	"	"
Vitis sp.	1000 ✓	" "	"	"
Vitis sp.	500 ✓	" "	4/11/40	Truck
Lespedeza bicolor	5000 ✓	" "	"	"
Prunus americana	2610 ✓	" "	"	"
Juniperus sp.	500 ✓	SCS, Winona, Minn.	4/6/40	Express

The following quantities of surplus seed, harvested by combine and CCC labor at Swan Lake, were distributed to other refuges and agencies:



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Bushy pondweed	100 "	Tamarac Refuge	2/22/40	"
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C. occidentalis	3000	" "	"	"
Lespedeza bicolor	5000	SCS, Elsbury, Mo.	3/27/40	"
Morus alba	1000	" "	"	"
Prunus serotina	5000	" "	"	"
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<u>Species</u>	<u>Amount</u>	<u>Refuge and Date</u>	<u>Delivery</u>
Smartweed (Mostly	1000#	✓ Lake Bowdoin, 2/7/40	Freight
P. Pennsylvanicum)	400#	✓ Blackwater Refuge, 2/22/40	"
"	300#	✓ Noxubee Refuge, 2/22/40	"
"	1000#	✓ White River, 2/23/40	"
"	300#	✓ Turnbull Refuge, 2/23/40	"
"	300#	✓ Nine-Pipe & Pablo, 2/27/40	"
"	200#	✓ Red Rocks Lakes, 2/27/40	"
"	500#	✓ Mo. Consv. Comm., 3/21/40	"

Total -n 4000 lbs.

Public Relations

During the week of March 17 - 23, the press dispatches prepared by the Washington Office (Bureau and Division stories) were released to the local papers at Sumner, Brookfield, and Chillicothe ~~and~~ these articles being published ~~in their entirety~~ in the local (Sumner) paper and in condensed form in the Chillicothe Constitution Tribune and Brookfield Argus, all of the editors concerned advising they would be pleased to devote as much space as possible to future releases of this nature. Weather and road conditions were unfavorable for inspection of the refuge during the week of the 17-23 and most of the visiting public appeared on Sunday, March 24 and on following weekends through the month of April. About 900 visitors appeared at the refuge from March 24 - May 1st, the heaviest individual attendance occurring on April 14, the occasion of the annual CCC open house, when six hundred visitors inspected ~~the~~ the ~~the~~ Camp and Refuge.

On March 26, the writer attended a weekly meeting of the



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Brookfield, Missouri Rotary Club to describe the work of the Biological Survey and refuges administered by the Bureau, using the subject matter contained in the "Suggestions for Local Talks" prepared by the Washington Office.

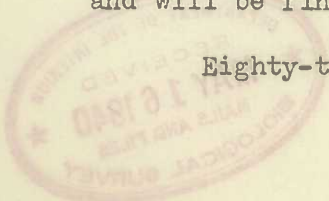
Official visitors at the refuge this quarter included Mr. Salyer, Division Chief and Mr. Anderson of the Training and Personnel Section of the Washington Office, Regional Director Tonkin and Mr. Miller of the Regional Office, W. E. Hall, District Engineer, Messrs. Roberts, McKinney, Johnson, and Green of the State Conservation Commission Enforcement Division, and Mr. Allin, U. S. Game Management Agent.

Construction and Other Items

Buildings at the refuge headquarters and patrolman's quarters have been completed and are now occupied by refuge personnel. The well at secondary headquarters was cleaned and deepened to provide a water supply for the buildings and landscaping at both sites is nearly completed, and the lawns seeded to bluegrass. A concrete silo at the main headquarters site was converted into an observation tower through construction of stairway and cab and this structure was available for patrol use during the spring flight and fire season.

The levees for the upper pool are 70% complete at this time and will be finished about October 1st.

Eighty-two nesting boxes were erected on the Yellow Creek



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The levees for the upper pool are 70% complete at this time

and will be finished about October 1st.

Two nesting boxes were erected on the Yellow Creek



bottoms to attract nesting wood ducks.

Three cooperative farming permits were issued to local farm operators during this period, involving the use of approximately 180 acres of refuge land, 1/3 of the crop to be retained for feeding purposes.

Work projects contemplated during the next quarter include cover mapping, sodding of refuge levees completed to date, planting of aquatic and marsh vegetation, fencing, and erection of additional boundary markers.

Kenneth H. Krumm
Signature

Jr. Refuge Manager
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